Accusys InneRAID® Slim SATA
User Manual

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Preface

Notice

Product features and specifications described in this manual are subject to change without notice.

The manufacturer shall not be liable for any damage, or for the loss of information resulting from the performance or use of the information contained herein.

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About This manual

This manual is designed and written for users of the Accusys InneRAID® Slim. The user should ideally be familiar with RAID planning and data storage operations and have experience in electronic or computer engineering.

Symbols used in this manual

Important information that users should be aware of is indicated with the following icons:

Caution

This icon indicates the existence of a potential hazard that could result in personal injury, damage to your equipment or loss of data if the safety instruction is not observed

Note

This icon indicates useful tips on getting the most from your RAID controller.

1. Introduction to the Accusys InneRAID® Slim

Congratulations on the purchase of your new Accusys InneRAID® Slim. The InneRAID® Slim RAID box is an excellent solution of protecting data and improving system availability for industrial computing and communication platforms. It performs block-level data mirroring to protect data of all types and of any operating systems. It also seeks to secure every bit of your data while streamlines the IO access serving by its intelligent RAID technology.
The InneRAID® Slim is equipped with StorConn™ Java-based GUI (graphical user interface) monitoring program, by which users can easily monitor the RAID status from web browsers at a remote site. The monitoring program is also capable of sending out notification mail to users so that you can always be informed of the updated status of your InneRAID® Slim.

1.1. InneRAID® Slim capabilities

- Hardware-accelerated RAID 1 (disk mirroring)
- High-speed data buffer for read pre-fetch and write cache
- Automatic online fast disk data rebuilding
- Automatic disk failure detection
- Online bad sector recovery and reallocation
- Hot swappable hard disks

1.2. Regulatory information

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/television technician for help.

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Shielded interface cables, if any, must be used in order to comply with the emission limits.

CE Mark

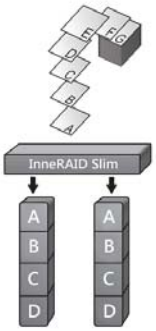
This equipment is in conformity with the EMC directive.

UL Listed

This equipment meets UL's safety requirements.

1.3. Understanding RAID Level

1.3.1. RAID 1 (mirroring)



RAID 1 is commonly referred to as Disk Mirroring, Disk Shadowing or Disk Duplexing as all data is duplicated across both disks. RAID 1 can only be performed with two hard drives. As data is identical on both disks, storage capacity is that of the smaller disk. RAID 1 has normal performance for write operations but high performance for read intensive operations.

Characteristics

- Better Read transaction rate than single disks, same Write transaction rate as single disks.
- 100% redundancy of data means no rebuild of data is necessary in case of disk failure, just a copy to the replacement disk.
- All the disks have the same data.
- Raid level 1 requires two drives.
- Storage capacity = Capacity of smaller disk

Recommended Uses

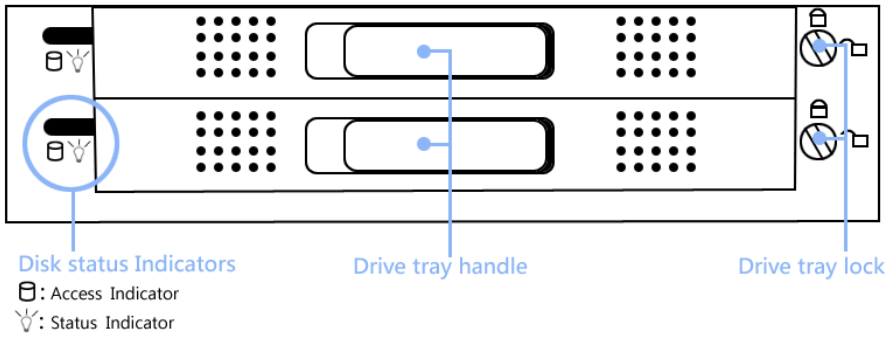
- Accounting
- Payroll
- Financial
- Any application requiring high availability

2. Know your InneRAID® Slim SATA

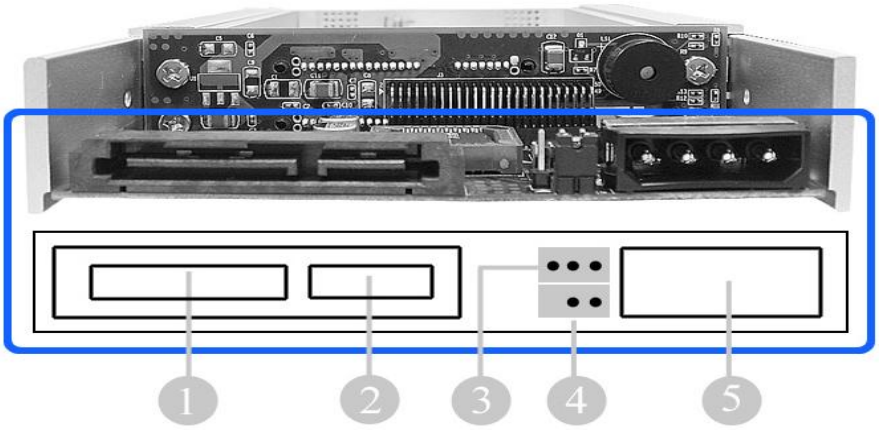
2.1. Package content

1. InneRAID® Slim SATA RAID box with 2 drive trays
2. InneRAID® Slim Quick Install Guide
3. Accusys InneRAID User Kit CD
4. Internal RS232 (3 to 9) cable with bracket
5. Serial/RS232 (9 to 9) cable
6. Two keys for drive trays
7. Mounting screw pack (18 in 1)

2.2. Front View



2.3. Rear view:



1. SATA DC power input connector
2. SATA host connector
3. RS232 connector (J10)

4. Reserved for future functions (J9 default is closed)

5. Standard AT/ATX DC power input connector

Note

InneRAID® slim provides a SATA form DC power connector and reserves an AT/ATX standard DC power connector. Most of current AT/ATX power supply module provides the SATA form DC power output connectors. Just choose one of them for the DC power input connection of InneRAID® Slim.

3. Set up your InneRAID® Slim SATA

Caution

Before starting any kind of hardware installation, please ensure that all power switches have been turned off and all power cords are disconnected to prevent personal injury and damage to the hardware.

Caution

Static electricity can damage electronic components. To guard against such damage:

Work in a static-free environment

Wear a grounded anti-static wrist strap

Store uninstalled components in anti-static bags

Handle PCBs by their edges and avoid touching chips and connectors.

3.1. Mounting your InneRAID® Slim SATA

The InneRAID® Slim SATA can be installed inside an external 3.5" bay of your computer case. The steps below describe the installing procedure.

Caution

Turn off and disconnect all electrical power from the system before beginning installation.

1. Remove the cover and front bezel from the system case.
2. Feed a power cable through the opening.
3. Feed a SATA cable through the opening.
4. Connect the two cables to the connectors on the rear of the InneRAID® Slim.
5. For the optional, if planning to use the StorConn GUI to monitor the status of RAID box through out-band or upgrade firmware through hyper terminal, you should also connect a 3-pin RS-232 cable to the terminal on the J10 of InneRAID® Slim. (Figure 3.2.A)

Figure 3.2.A

6. Insert the InneRAID® Slim into the bay, and secure it in place with the screws provided. (Figure 3.2.B)

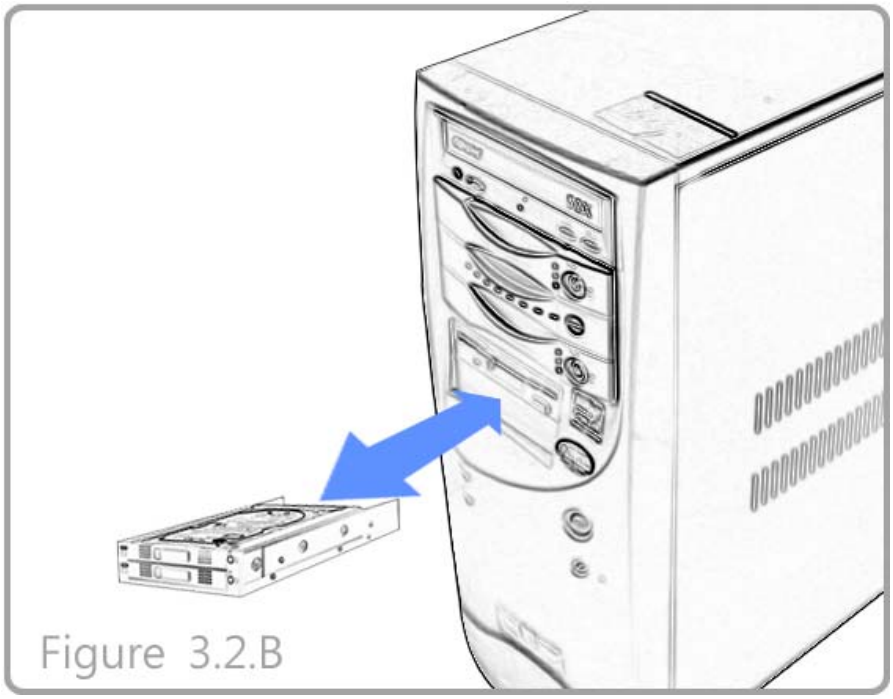
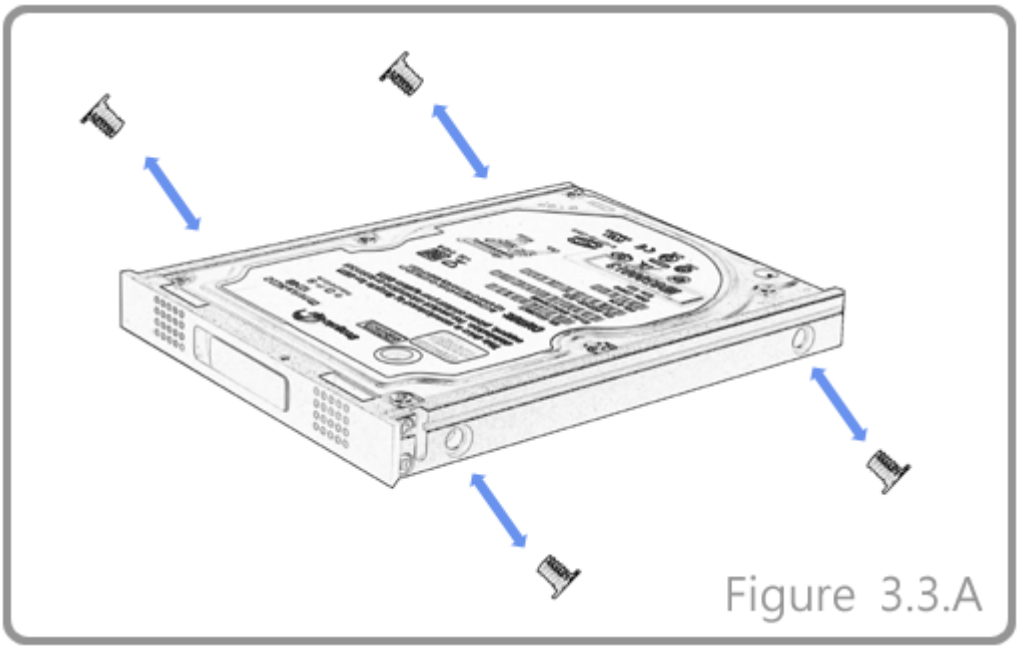


Figure 3.2.B

3.2. Loading hard disks in your InneRAID® Slim SATA

1. Unlock the drive tray and slide it out of the RAID box.
2. Place the disk drive in the drive tray.
3. Secure the disk drive by screwing it to the drive tray case. (Figure 3.3.A)



4. Slide the loaded disk drive tray into the RAID Box and lock it.
5. If you have installed two new disk drives go to Application 1. If you have installed one drive with data and one new disk drive go to Application 2.

3.2.1. Application 1: Two new disk drives (identical or non-identical)

1. Install and lock both drive trays.
2. Turn on the computer system.
3. When the system prompts you to enter the BIOS setup program shortly after power-on, follow the instructions and enter the BIOS setup program. The device name of hard disk will be **Accusys InneRAID Slim SATA**.
4. Reboot the computer and your system is now ready to start using the RAID and to automatically mirror all data written to it on two disk drives.
5. If you have installed two hard drives with different capacity, the usable RAID capacity will be the same as the capacity of the smaller hard drive.

3.2.2. Application 2: Installing one drive with data and one new backup drive

1. The new drive must have the same capacity or a larger capacity than the drive with data. Installing the drive with data and leave the new drive uninstalled. This identifies the drive with data as the source drive.

Note

When you install the drives, the first drive to get installed is designated as the source drive and the other drive becomes the backup drive.

2. Turn on the computer system.
3. When the system prompts you to enter the BIOS setup program shortly after power-on, follow the instructions and enter the BIOS setup program. The device name of hard disk will be **Accusys InneRAID Slim SATA**.
4. Reboot the computer and install the new drive. This identifies the new drive as the backup drive.
5. The system will immediately begin mirroring the data from the first drive to the backup drive. Any old data on the backup drive will be lost, and is overwritten with the mirror image of the first drive.

3.3. Status of all LED indicators

Status indicator	Access indicator	RAID status
Green	Off	Disk is properly installed
Green	On/flash (Yellow)	Disk is being accessed
Red	Off	No disk installed or disk failure
Flash (Red/Green)	On/flash (Yellow)	Disk is rebuilding

3.4. Formatting and Partitioning your InneRAID® Slim SATA

If you installed two new disks in InneRAID® Slim, it needs to be formatted. During this process, the array can also be customized with partition. As you format the drive, you will have the opportunity to divide the hard drive into sections, called partitions. A partition is a section of the hard drive's capacity that is created to contain file and data.

3.4.1. Windows Users

Caution

Formatting drive will crash all data in the drive.

After having followed the steps to install two new disks in InneRAID® Slim and connect the SATA cable to the host computer, the RAID must now be formatted and partitioned before it can be used.

1. Right click **My Computer** and click **Manage**.
2. From the **Computer Management** window, select **Disk Management**. (Figure 3.4.1.A)
3. If the **Initialize and Convert Disk Wizard** window appears, click **Cancel**.
4. Windows operation system will list all the hard drives that are installed on the system. Locate the InneRAID® Slim drive that is represented by the icon. Right click the icon and select **Initialize.**

5. In the drive box to the right shows **Unallocated**, right click and select **New Partition**.

(Figure 3.4.1.B)

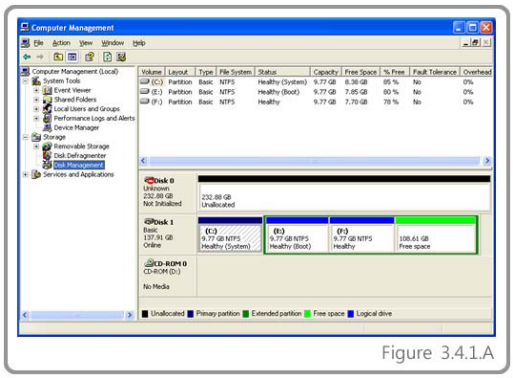


Figure 3.4.1.A

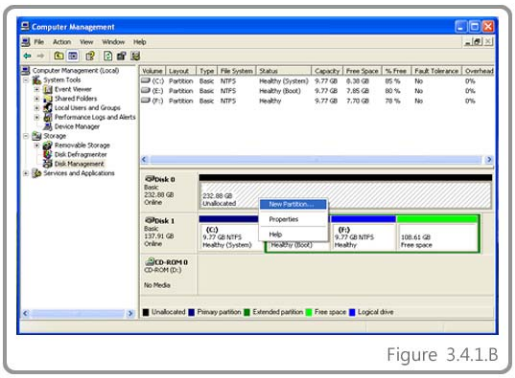


Figure 3.4.1.B

6. The **New Partition Wizard** dialog box will appear, click **Next** to continue. (Figure 3.4.1.C)
7. After selecting partition type, specifying partition size and assigning drive letter, the **Format Partition** dialog box (Figure 3.4.1.D) will appear, you have the option of selecting the **Quick Format** option. This allow mach fast formatting, however, this disallow Disk Management to check the drive sector for errors. Click Next to start the format process.
8. Your drive should now appear in your **My Computer** and ready for use.

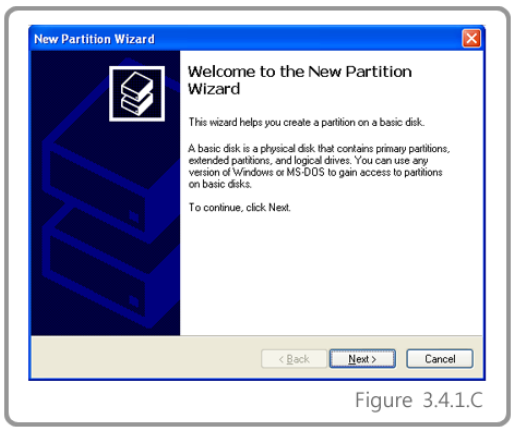

New Partition Wizard
Welcome to the New Partition Wizard
This wizard helps you create a partition on a basic disk.
A basic disk is a physical disk that contains primary partitions, extended partitions, and logical drives. You can use any version of Windows or MS-DOS to gain access to partitions on basic disks.
To continue, click Next.
< Back
Next >
Cancel

Figure 3.4.1.C

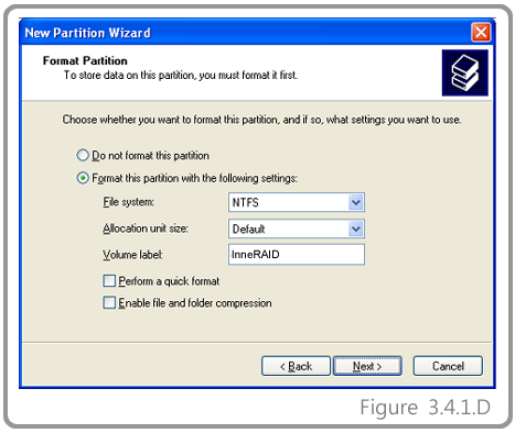

New Partition Wizard
Format Partition
To store data on this partition, you must format it first.
Choose whether you want to format this partition, and if so, what settings you want to use.
Do not format this partition
Format this partition with the following settings:
File system:
NTFS
Allocation unit size:
Default
Volume label:
InneRAID
Perform a quick format
Enable file and folder compression
< Back
Next >
Cancel

Figure 3.4.1.D

4. Management

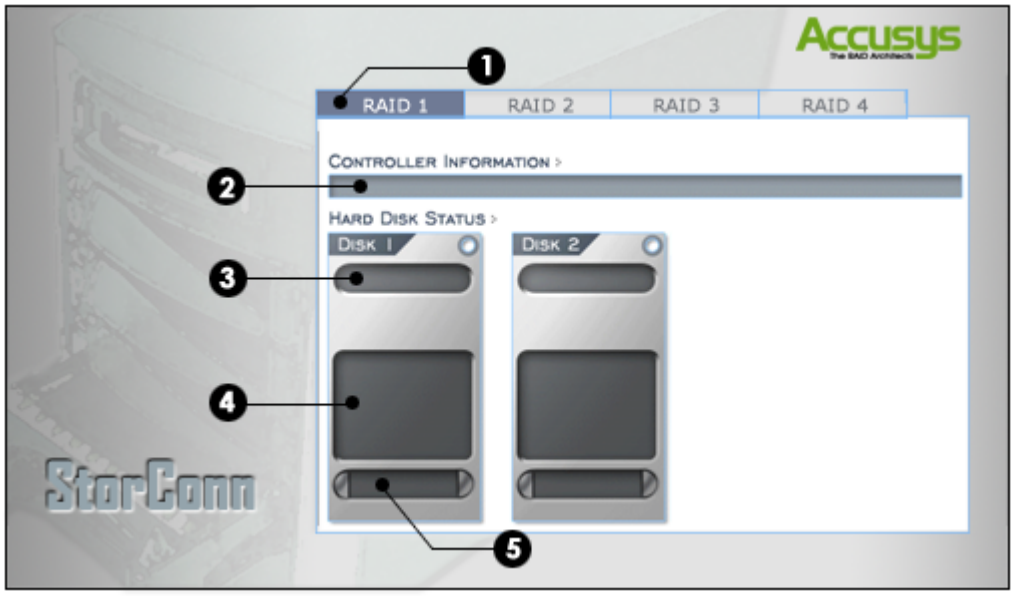
4.1. StorConn GUI introduction

InneRAID® Slim supports remote RAID subsystem monitoring by web-based GUI. This section covers the introduction of the monitoring software.

Key Features
■ Graphical User Interface (GUI)
■ Multi-interface support
■ Remote monitoring
■ Web-based environment
■ Event notification

StorConn monitoring program, a web-based GUI supporting In-band interface via SATA channel and Out-band interface via RS-232, by which customers can monitor the RAID status from web browsers at a remote site of LAN (Local Area Network). The StorConn is also capable of sending out notification mail to the customers.

4.1.1. RAID status monitoring window



1. RAID controller tab: Allows customer to select which RAID that connected to local host system both through out-band and in-band to monitor.

2. Controller information: Lists model name, serial number and current RAID level.

3. Disk status: Allows customer to monitor the status of each disk drive.

4. Disk information: Lists model name and capacity of each disk drive.

5. Re-build / initialize progress: Tracks the re-building or initialization process.

5. Update Firmware

InneRAID® Slim allows updating firmware via RS-232 interface. The firmware can be updated from a host PC with third party communication software, such as HyperTerminal, that supports ANSI terminal emulation. The setup process for HyperTerminal will be guided in this chapter.

Note

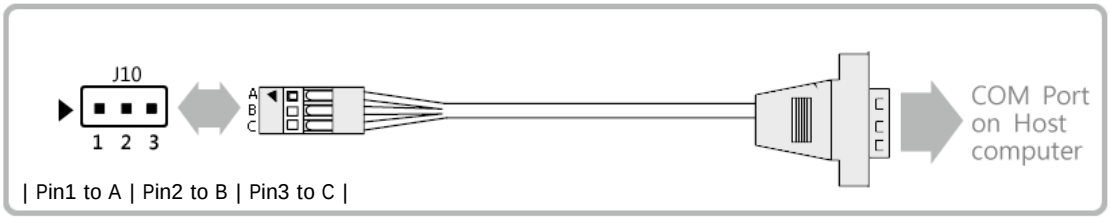
The data and configurations on the array are not affected by firmware updating.

Note

The HyperTerminal is bundled as standard with Microsoft Windows operating system. It will be found in the Communications folder. The program can also be download from Higraeve Software at http://www.higraeve.com/htpr/

5.1. Firmware updating steps

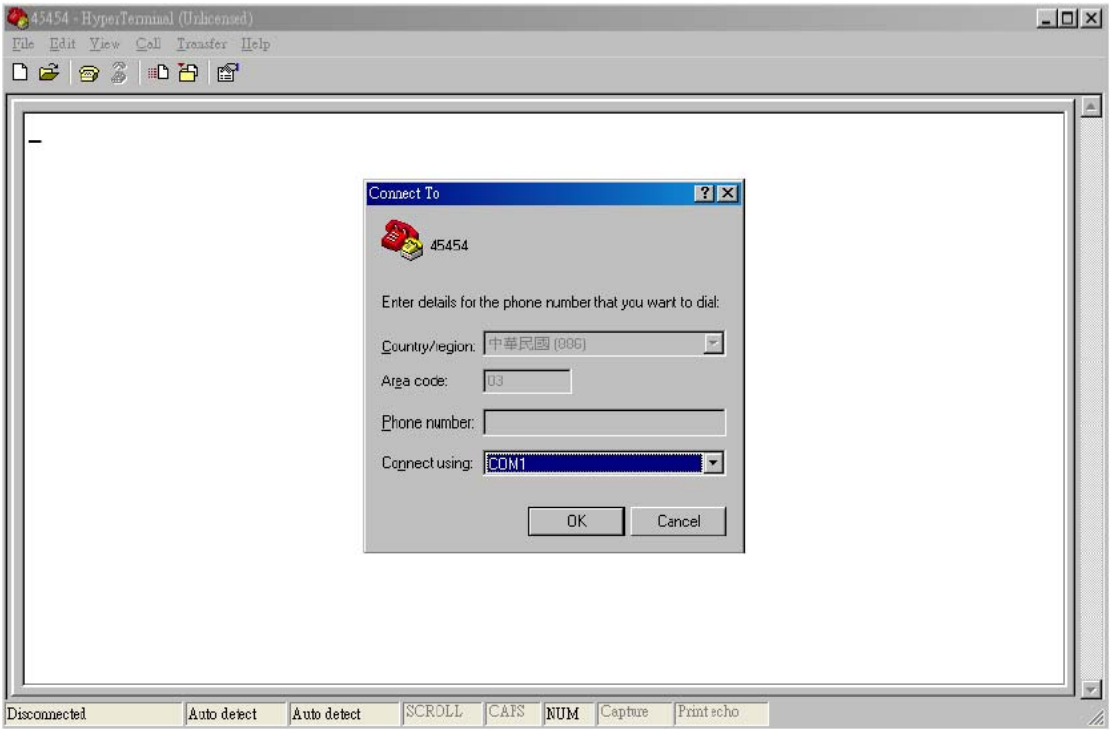
1. Ensure your InneRAID® Slim is turned off.
2. Connect one end of the supplied RS-232 cable to the RS-232 3pin port from the Pin1,2,3 of the J10 on your InneRAID® Slim, and connect the other end to one of the host computer's COM port.



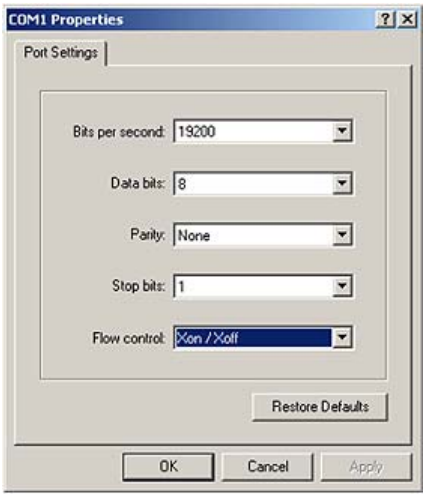
3. Launch HyperTerminal from the host computer: Start > Programs > Accessories > Communications > HyperTerminal.

4. Select COM1 or COM2 from the Connect using: dropdown menu, depending on which port

is connecter to InneRAID® Slim.



5. The COM properties dialog box will appear. Set the following values:



Bit per second: 19200

Data bits: 8

Parity: None

Stop bits: 1

Flow Control: Xon/Xoff

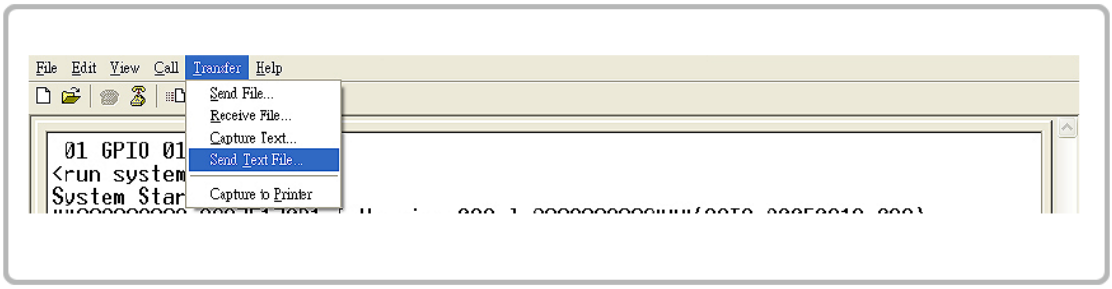
6. Turn on the InneRAID® Slim and press the **ESC** button on the host computer keyboard. The "**>>>**" prompt will appear.

7. Type in the command "download" to go to the firmware download mode, then type "1" to

download code (Firmware or Bootcode).

```
>>> download
restart ...FF9E  01 AGPIO 01 RAID level =  01  01 AAA 01  01
============= InneRAID Slim PATA Download Mode ============
Enter  '1'      to Download Code (Firmware, Bootcode)
       'ESC'    exit
       'r'      reset
-------------------------- version: Boot ---- 10 (a) ---- 04 Downloading Code!
Flash type:  SST39VF040
```

8. Locate the updates firmware file to send. For HyperTerminal, go to the **Transfer** menu and select **Send Text File**.



9. Send the firmware file as a text file. The file will start to download.

Caution

Do not turn off the system or interrupt program during firmware-updating procedure.

10. When the file has been downloaded, after InneRAID® Slim restarted, the firmware updating procedure is finished.

6. FAQ

If you encounter a problem while using InneRAID® Slim, check this section for help.

1. Can I monitor the status of InneRAID Slim remotely?

Answer: Yes, we provide a web-based GUI program "StorConn", the program and manual both included with CD-ROM, please refer to manual for installing StorConn on your host system.

2. Why does red indicator turn on and alarm beeper sounds?

Answer: the disk status indicator shows red to alert that disk failed, for data security, please immediately replace the failed disk with a new one, data rebuilding will then begin.

3. Why doesn't host computer detect the RAID box while booting?

Answer: 1. Make sure the host interface connection cable is attached securely to SATA port of RAID box.

2. Please enter BIOS to check the configuration of SATA channel. Make sure the SATA channel is enabled.

4. Why does the RAID box fail when removing J9 jumper cap?

Answer: the J9 is reserved for functions expand. Please always leave it shorted for ensuring that the RAID box functions properly.

Caution

Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions

7. Contact Accusys

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